



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 7

11201 Renner Boulevard
Lenexa, Kansas 66219

MAY 25 2016

3960 Chouteau Corporation
c/o Gilbert Dolgin
12369 Country Glen Lane
St Louis, MO 63141

Re: Former Independent Petroleum Co.
Confirmation Indoor Air Sampling

Mr. Dolgin:

On March 8, 2016, representatives of the United States Environmental Protection Agency (EPA) collected indoor air samples from your property at 3960 Chouteau Avenue in St Louis, Missouri. The samples were collected to evaluate whether the vapor mitigation system you installed is working, and whether the indoor air concentrations for the chemicals of concern at the site exceed applicable health-based standards.

A summary report including the sampling results is enclosed. Table 3 in the summary report lists post-mitigation results for the five volatile organic compounds (VOCs) of concern. November 2014 results from the indoor air sample collected at the dance floor area near SSG-4 are included for comparison. PCE was the only VOC detected post-mitigation, and the concentrations were about 9 to 10 times lower than pre-mitigation levels and well below applicable health-based screening levels. This information is being provided to you in accordance with Section 104(e)(4)(B) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended.

Continued operation and maintenance of the sub-slab vapor mitigation is necessary to ensure that indoor air concentrations of the VOCs underlying the property remain below applicable health-based standards. As previously discussed, a restrictive environmental covenant should be placed on the property stipulating the conditions for continued operation and maintenance of the vapor mitigation system.

Please contact me at (913) 551-7328 or David Hoefer of our Office of Regional Counsel at (913) 551-7503 as soon as possible to finalize the environmental covenant.

Sincerely,

Michael B. Davis
On-Scene Coordinator
Planning and Preparedness South Section
Superfund Division

Enclosures

Cc: Joshua Moore, Schiff Hardin

B788

40508177



Superfund

0400

5/25/16

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TETRA TECH

April 7, 2016

Mr. Michael Davis
On-Scene Coordinator
U.S. Environmental Protection Agency, Region 7
8600 NE Underground Drive, Pillar 253
Kansas City, Missouri 64161

**Subject: Trip Report and Data Summary – Vapor Intrusion Sampling
Independent Petrochemical Corporation Site, Saint Louis, Missouri
CERCLA ID: MOD066919440
U.S. EPA Region 7, START 4 Contract No. EP-S7-13-06, Task Order No. 0066
Task Monitor: Michael Davis, EPA On-Scene Coordinator**

Dear Mr. Davis:

Tetra Tech, Inc. is submitting the enclosed Trip Report and Data Summary regarding vapor intrusion sampling in March 2016 at the Independent Petrochemical Corporation site in Saint Louis, Missouri. If you have any questions or comments regarding this submittal, please contact the Project Manager at (816) 412-1771.

Sincerely,

Jenna Mead, RG
START Project Manager

Ted Faile, PG, CHMM
START Program Manager

Enclosures

cc: Debra Dorsey, START Project Officer (cover letter only)

**TRIP REPORT AND DATA SUMMARY
VAPOR INTRUSION SAMPLING – MARCH 2016**

**INDEPENDENT PETROCHEMICAL CORPORATION SITE
SAINT LOUIS, MISSOURI**

**Superfund Technical Assessment and Response Team (START)
Contract No. EP-S7-13-06, Task Order 0066**

Prepared For:

U.S. Environmental Protection Agency
Region 7
11201 Renner Boulevard
Lenexa, Kansas 66219

April 7, 2016

Prepared By:

Tetra Tech, Inc.
415 Oak St.
Kansas City, Missouri 64106
(816) 412-1741

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1.0 INTRODUCTION

The U.S. Environmental Protection Agency (EPA) Region 7 Superfund Division, under authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA), tasked Tetra Tech, Inc., (Tetra Tech) to conduct an Integrated Site Assessment (ISA) consisting of a Removal Site Evaluation (RSE) and a Site Reassessment (SR) of the Independent Petrochemical Corporation (IPC) site (the site) at 3930 Chouteau Avenue in Saint Louis, Missouri (the City). The site had been used for storage and distribution of organic solvents, coal oil, and petroleum products from about 1925 until the early 1980s. Investigations in 1988 detected numerous contaminants in soil and groundwater, indicating releases to the environment had occurred. The ISA was conducted in 2014 under the Superfund Technical Assessment and Response Team (START) 4 contract, Task Order Number 0066. The purpose of the ISA was to determine the nature and general extent of contamination in groundwater, soil, sub-slab soil gas, and indoor air presenting a threat to human health and the environment (Tetra Tech 2015).

2.0 SITE BACKGROUND INFORMATION

Information regarding the site's location, description, and relevant investigation history appears in this section.

2.1 SITE LOCATION

The IPC site is in urban Saint Louis, St. Louis County, Missouri (see Figure 1, Appendix A). The site is near the intersection of South Vandeventer Avenue, Manchester Avenue, and Chouteau Avenue, about 0.25 mile south of Interstate I-64. The population of the City is approximately 320,000 (Mable/Geocorr 2010). Geographic coordinates of the approximate center of the site are 38.62787 degrees north latitude and 90.24645 degrees west longitude. This area of the City has not been surveyed into sections, townships, and ranges; however, its approximate location would be Township 45 North, Range 7 East of the Granite City 7.5-minute topographic quadrangle map (U.S. Geological Survey [USGS] 1998).

2.2 SITE HISTORY AND DESCRIPTION

The IPC facility began operation prior to 1925 and continued though at least May 1982—the date of a Resource Conservation and Recovery Act (RCRA) compliance inspection. The compliance inspection found that the facility stored and distributed organic solvents, coal oil, and petroleum products. Bulk materials would arrive by truck or railcar and be transferred to tanker trucks or drums for local distribution. Small amounts of blending occurred on site (Missouri Department of Natural Resources [MDNR] 1982). Hazardous substances associated with the site include acetone, benzene, 2-butanone (methyl ethyl ketone), butyl acetate, butyl alcohol, carbon tetrachloride, cyclohexane, cyclohexanone, dibutyl phthalate, dioctyl phthalate, ethyl acetate, ethylene dichloride, isobutyl alcohol, isophorone, methanol, methyl isobutyl ketone, methylene chloride, 2-nitropropane, 1,2-dichlorobenzene, tetrachloroethene (PCE), sodium hydroxide, tetrahydrofuran, toluene, 1,1,1-trichloroethane (TCA), and xylene (EPA 1982).

In 1988, on-site structures included an oil warehouse (west building) and a garage/oil storage building (east building). More than 30 aboveground storage tanks (AST), mostly 15,000-gallon tanks, were between these two buildings (Ecology & Environment, Inc. [E&E] 1988 a, b). Historical Sanborn Fire Insurance Maps indicated at least 13 underground storage tanks (UST) also had been present in that area. The ASTs and USTs are no longer present, and this area is a gravel parking lot. Currently, the north building is a bar and the south building is a warehouse leased for storage and repair of automobiles.

The property is currently owned by the 3960 Chouteau Corporation (Geo St. Louis 2016). The approximately 1-acre site includes gravel parking areas between the two buildings. Concrete is also present at the bar and warehouse; however, it is covered by gravel at the warehouse. The site is in a commercial/industrial section of the City; residential areas are within 0.5 mile of the site. The site is bounded north by Chouteau Avenue, east by railroad tracks, south by warehouses and light industrial buildings, and west by a concrete drive for a fast food restaurant. Runoff from the site flows to the southeast toward the railroad tracks. The nearest perennial surface water body is the Mississippi River, approximately 3.5 miles east of the site. The Missouri and Mississippi Rivers supply most of the drinking water in the St. Louis area.

2.3 SITE GEOLOGY AND HYDROGEOLOGY

Soil at the site is composed of the Urban Land-Harvester complex. Urban Land areas are covered by streets, parking lots, buildings, and other structures that obscure or alter the soils so identification of the soils is not feasible. Harvester soils are moderately well drained and typically found in areas of woody vegetation and along hillsides. Water capacity of Harvester soils is moderate (U.S. Department of Agriculture [USDA] 1979).

The site is within the Dissected Till Plains physiographic province (Miller 1974). Stratigraphy in the St. Louis area consists largely of limestones and dolomites that were deposited in shallow epicontinental seas. Some shales, siltstones, and sandstones are interbedded with these carbonates (E&E 1989a). The site overlies the post-Maquoketa aquifer group. This group contains bedrock units above the Ordovician-aged Maquoketa Shale. The Maquoketa Shale is likely a confining influence on groundwater movement. The most productive bedrock aquifers in the St. Louis area include the St. Peter Sandstone, Rubidoux Formation, Gasconade Dolomite, and Potosi Dolomite, which underlie the Maquoketa Shale. Alluvial aquifers also are important groundwater sources in the site area (Miller 1974).

2.4 PREVIOUS INVESTIGATIONS

In 1981, Charter Independent Oil Company, owner of IPC, filed an EPA Notification of a Hazardous Waste Site for the facility; EPA completed this form in 1982 (EPA 1982). In 1981-1982, MDNR conducted a Preliminary Assessment (PA), consisting of telephone interviews with company officials (E&E 1989a). On May 20, 1982, MDNR conducted a RCRA compliance inspection of the facility. The compliance inspection found no generation of wastes and no unsatisfactory features. Mis-pumpings, tank-heels, cross-contaminated products, etc., were reportedly sold under the name "Line Wash" as cleaning solvent to local paint manufacturers (MDNR 1982).

EPA contractor E&E conducted a second PA in November 1988 (E&E 1989a, b). At that time, the property was owned by the Dolgin Candy and Tobacco Company, which used the west building as a warehouse; metal store fixtures and industrial rollers were stored in the east building. During these investigations, 16 surface soil and 2 pooled water samples were collected. The pooled water samples were collected from drainage areas at the southeast corner of the site.

Numerous volatile organic compounds (VOC) were detected in the surface soil samples. Total xylenes were detected in seven surface soil samples at concentrations ranging from 16 to 23,000 micrograms per kilogram ($\mu\text{g/kg}$). 1,1-Dichloroethane (DCA) (3.0 to 2,300 $\mu\text{g/kg}$), 1,2-dichloroethene (DCE) (14 to 2,000 $\mu\text{g/kg}$), 1,1,1-TCA (35 to 3,400 $\mu\text{g/kg}$), PCE (10 to 350 $\mu\text{g/kg}$), toluene (540 to 5,800 $\mu\text{g/kg}$), and ethyl benzene (160 to 3,900 $\mu\text{g/kg}$) were detected in four samples. Vinyl acetate (170 to 17,000 $\mu\text{g/kg}$) was detected in three samples. 1,1-DCE (430 and 640 $\mu\text{g/kg}$), trichloroethene (TCE) (80 and 1,200 $\mu\text{g/kg}$), and chlorobenzene (460 and 1,900 $\mu\text{g/kg}$) were detected in two samples. 2-Butanone was detected in one sample at 2,000 $\mu\text{g/kg}$. None of these concentrations exceeded a Superfund Chemical Data Matrix (SCDM) benchmark (EPA 2004) or EPA Regional Screening Level (RSL) for industrial soil (EPA 2015). The samples containing the highest concentrations of these compounds had been collected from around a loading dock and oily seep-like areas along the south margin of the site (E&E 1989a).

Numerous semivolatile organic compounds (SVOC) were also detected in the surface soil samples. Bis(2-ethylhexyl)phthalate was detected in seven samples (including a duplicate sample) at concentrations ranging from 230 to 120,000 $\mu\text{g/kg}$, exceeding its Superfund Chemical Data Matrix (SCDM) cancer risk (CR) screening concentration of 10,000 $\mu\text{g/kg}$ in three samples. Pentachlorophenol (380 and 32,000 $\mu\text{g/kg}$) was detected in two samples, exceeding its CR of 1,000 $\mu\text{g/kg}$. Numerous polynuclear aromatic hydrocarbons (PAH) were detected in the surface soils. Benzo(a)pyrene (500 $\mu\text{g/kg}$) was detected in one sample, exceeding its CR of 20 $\mu\text{g/kg}$, and indeno(1,2,3-cd)pyrene (790 $\mu\text{g/kg}$) was detected in one sample, exceeding its CR of 200 $\mu\text{g/kg}$. Acenaphthylene, anthracene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenzofuran, 1,4-dichlorobenzene, 1,2-dichlorobenzene, di-n-octyl-phthalate, fluoranthene, 2-methylnaphthalene, naphthalene, phenanthrene, and pyrene were all detected in at least one sample. However, none of these concentrations exceeded an SCDM benchmark.

Analytical results from one pooled water sample indicated 1,2-DCE at 11,000 micrograms per liter ($\mu\text{g/L}$), along with vinyl chloride (750 $\mu\text{g/L}$), methylene chloride (650 $\mu\text{g/L}$), toluene (2,200 $\mu\text{g/L}$), ethyl benzene (2,900 $\mu\text{g/L}$), and total xylenes (1,100 $\mu\text{g/L}$). The other sample contained 1,2-DCE (2,100 $\mu\text{g/L}$), vinyl chloride (550 $\mu\text{g/L}$), and 1,1,1-TCA (340 $\mu\text{g/L}$) (E&E 1989a).

In 2014, START conducted an ISA, and collected soil, groundwater, surface water (sump), and vapor intrusion (VI) samples at the site. In addition, START subcontractor Construction Solutions, Inc. of Paola, Kansas, performed a ground penetrating radar (GPR) scan and electromagnetic (EM) survey to determine whether USTs remained. An area where USTs had been previously excavated was located, but no remaining USTs were identified. EM readings confirmed the GPR data, indicating an area of excavation and fill, but no buried tanks. Figure 2 shows locations of soil, groundwater, and surface water sampling.

Sub-slab soil gas samples were collected from sampling ports installed at six locations at the two buildings. Four sample locations were in the bar, and two were in the warehouse. In November 2014, START conducted additional sub-slab soil gas sampling and collected an indoor air sample from each building. Figure 2 shows locations of sub-slab and indoor air sampling.

START collected soil samples at eight on-site locations using direct-push technology (DPT). Soil borings were advanced to a maximum of 16 feet below ground surface (bgs) at six locations and to equipment refusal (about 10-12 feet bgs) at two locations. Between two and four samples were collected for analysis at each boring. The VOC 1,1,2,2-tetrachloroethane (6,100 µg/kg) exceeded its SCDM CR of 3,000 µg/kg in one shallow soil sample. Seven soil samples contained concentrations of purgeable total petroleum hydrocarbons (TPH) – gasoline-range organics (GRO) that exceeded the Missouri Risk-based Corrective Action (MRBCA) Lowest Default Target Level (LDTL) for TPH-GRO. Two samples contained concentrations of extractable TPH – diesel-range organics (DRO) that exceeded the MRBCA LDTL for TPH-DRO (MDNR 2006). Each of the SVOCs benzo(a)anthracene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, dibenzo(a,h)anthracene, bis(2-ethylhexyl)phthalate, and pentachlorophenol exceeded its SCDM CR benchmark level in at least one soil sample. Arsenic concentrations also exceeded the SCDM CR; however, these concentrations were determined to be representative of naturally occurring background concentrations (Tetra Tech 2015).

START installed and sampled five Geoprobe temporary wells on the site at depths ranging from 9 to 36 feet bgs. Benzene concentrations exceeded the SCDM CR at all five groundwater sample locations. At four of the locations, benzene concentrations also exceeded the 5 µg/L maximum contaminant level (MCL). In groundwater sample GW-1, the chlorinated solvents PCE (8.4 µg/L), TCE (18 µg/L), and vinyl chloride (13 µg/L) were detected at concentrations exceeding their MCLs (5 µg/L for PCE and TCE; 2 µg/L for vinyl chloride). This sample was collected at 36 feet bgs near the southeast corner of the property. Vinyl chloride was also detected at 6.2 µg/L in groundwater at 16 feet bgs at GW-6, about 130 feet north of GW-1. The highest concentrations of benzene and other fuel-related VOCs were at

groundwater (GW) location GW-4, in the central part of the site where the oil and gasoline storage tanks had been located. TPH-GRO concentrations exceeded the 18,100 µg/L MRBCA LDTLs in samples from GW-2 and GW-4, and TPH-DRO concentrations exceeded the 34.3 micrograms per liter (mg/L) LDTL in groundwater from GW-6. Each of total arsenic, barium, cadmium, chromium, and lead concentrations exceeded MCLs in at least one sample; however, this could have resulted in part from turbidity of the sample. Dissolved concentrations of arsenic were similar to the total concentrations and exceeded the 10 µg/L MCL in four of the five samples. No other dissolved metals concentrations exceeded MCLs.

The surface water (sump) sample contained low concentrations of the VOCs acetone (8.4 µg/L), chloroethane (1.4 µg/L), naphthalene (4.5 µg/L), and toluene (3.0 µg/L), and total metals arsenic (10.1 µg/L), barium (109 µg/L) and lead (1.0 µg/L). No SVOCs or TPH were detected.

In August 2014, EPA and START installed four sub-slab ports in the bar and two in the warehouse to evaluate potential VI at these buildings. Seven sub-slab soil gas samples (including one duplicate) were collected into 6-liter Summa canisters and submitted for VOC analyses. Sub-slab vapors that exceeded 10 times EPA's RSL benchmarks for industrial air were considered indicative of possible exposure (based on the assumption that about 10 percent of sub-slab vapors migrate to indoor air).

Table 1 lists concentrations of five VOCs (1,1-DCA, chloroform, PCE, TCE, and vinyl chloride) that exceeded RSL benchmarks for industrial air by a factor of 10.

TABLE 1

**VOC SUMMARY OF AUGUST 2014 SUB-SLAB SOIL GAS SAMPLES
INDEPENDENT PETROCHEMICAL CORPORATION SITE
ST. LOUIS, MISSOURI**

Sample Location ID	Sample Number	Sample Date	Sample Time	1,1-Dichloroethane	Chloroform	Tetrachloroethene	Trichloroethene	Vinyl Chloride
				Concentration (µg/m³)				
EPA RSL (Industrial Air), 1E-05 cancer risk				77	5.3	470	30	28
EPA RSL (Industrial Air), HI=1 (non-carcinogenic effects)				NE	430	180	8.8	440
SSG-1 (Bar – kitchen)	6561-1	08/27/2014	0737	2.1	1.4	7.4	1.2	0.55 U
SSG-2 (Bar – main bar)	6561-2	08/27/2014	0752	1.1	3.3	210	1.1 U	0.55 U
SSG-3 (Bar – back lounge)	6561-3	08/27/2014	0806	0.84 U	5.5	330	87	0.55 U
SSG-4 (Bar – dance floor)	6561-4	08/27/2014	0820	69,000	460	140,000	28,000	5.5 U
SSG-4 (Bar – dance floor)	6561-4-FD	08/27/2014	0820	83,000	560	160,000	37,000	5.5 U
SSG-5 (Warehouse – east)	6561-5	08/27/2014	0847	630	10	1,500	1,700	1,400
SSG-6 (Warehouse – west)	6561-6	08/27/2014	0917	13	10	570	78	5.5 U

Notes:

BOLD value exceeds the lowest RSL for indoor air by a factor of 10 or more.

EPA U.S. Environmental Protection Agency

FD Field duplicate

HI Hazard index

ID Identification

 $\mu\text{g}/\text{m}^3$ Micrograms per cubic meter

NE Not established

RSL Regional Screening Level

SSG Sub-slab soil gas

U The analyte was not detected at or above the reporting limit

Chloroform, 1,1-DCA, PCE, and TCE exceeded RSLs by a factor of 10 or more in sample 6561-4 (and its duplicate) collected at the bar dance floor area. TCE and vinyl chloride exceeded the RSLs by a factor of 10 or more at the Warehouse (east) location. Vinyl chloride is a common degradation product of PCE or TCE. Petroleum contamination commonly enhances degradation of these chlorinated solvents.

Based on the elevated sub-slab vapors detected in August 2014, additional VI sampling was conducted in November 2014. At two locations where elevated concentrations of VOCs had been detected in August 2014, follow-up sub-slab soil gas and indoor air samples were collected. One location was in the warehouse (previous location of SSG-5) where elevated TCE and vinyl chloride had been detected. The other location was at the bar dance floor (previous location of SSG-4). Previously installed sub-slab sampling ports were used to collect the follow-up sub-slab soil gas samples. Indoor air samples were collected adjacent to the sub-slab samples. For collection of indoor air samples, the 6-liter stainless steel canister was fitted with a passive flow regulating device to enable collection over a continuous 8-hour period. One ambient air sample also was collected during the same 8-hour period at an outside location approximately 15 feet south of the warehouse. Table 2 summarizes the samples collected in November 2014.

The VOCs 1,1-DCA and TCE were identified in the November 2014 sub-slab soil gas samples at concentrations exceeding RSLs for industrial air (for a cancer risk of 1×10^{-5} , and a Hazard Index of 1 for non-carcinogenic effects) by at least a factor of 10. Table 2 presents the November 2014 indoor and ambient air results and compares the November 2014 sub-slab data to the August sub-slab data.

In the indoor air samples (6681-2, -5, and -5-FD), 23 VOCs were identified; however, no VOC concentration exceeded an RSL (for previously identified cancer and non-carcinogenic risk levels) in the indoor air samples. The indoor air samples collected in the bar (6681-5 and -5-FD) contained 1,1-DCA at 17 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) in each sample, PCE at $19 \mu\text{g}/\text{m}^3$ in each sample, TCE at 3.2 and $2.0 \mu\text{g}/\text{m}^3$, and vinyl chloride at 0.96 and $0.94 \mu\text{g}/\text{m}^3$. The indoor air sample collected in the warehouse (6681-2) contained PCE at $6.6 \mu\text{g}/\text{m}^3$.

In the ambient air sample (6681-3), 15 VOCs were identified. Of the contaminants identified at elevated concentrations in the sub-slab soil gas samples, only PCE was identified in the ambient air sample, at $4.3 \mu\text{g}/\text{m}^3$.

Based on potential for VI at the site, the building owner installed three vapor mitigation systems at the bar (west building) in early 2016.

TABLE 2

**SELECTED VOC SUMMARY OF 2014 VAPOR INTRUSION SAMPLES
INDEPENDENT PETROCHEMICAL CORPORATION SITE
ST. LOUIS, MISSOURI**

Sample Location ID	Sample Number	Sample Date	Sample Start Time	1,1-Dichloroethane	Chloroform	Tetrachloroethene	Trichloroethene	Vinyl Chloride
				Concentration (µg/m³)				
EPA RSL (Industrial Air), 1E-05 cancer risk				77	5.3	470	30	28
EPA RSL (Industrial Air), HI=1 (non-carcinogenic effects)				NE	430	180	8.8	440
Indoor Air Samples								
Indoor @ SSG-4 (Bar – dance floor)	6681-5	11/20/2014	08:13	17	1.0 U	19	3.2	0.96
Indoor @ SSG-4 (Bar – dance floor)	6681-5-FD	11/20/2014	08:13	17	1.0 U	19	2.0	0.94
Indoor @ SSG-5 (Warehouse – east)	6681-2	11/20/2014	07:45	0.84 U	1.0 U	6.6	1.1 U	0.55 U
Ambient Air Sample								
Outside Ambient Air	6681-3	11/20/2014	07:47	0.84 U	1.0 U	4.3	1.1 U	0.55 U
Sub-Slab Vapor Samples								
SSG-4 (Bar – dance floor)	6561-4-FD	08/27/2014	08:20	83,000	560	160,000	37,000	5.5 U
SSG-4 (Bar – dance floor)	6561-4	08/27/2014	08:20	69,000	460	140,000	28,000	5.5 U
SSG-4 (Bar – dance floor)	6681-4	11/20/2014	08:12	2,400	16	4,100	580	5.5 U
SSG-5 (Warehouse – east)	6561-5	08/27/2014	08:47	630	10	1,500	1,700	1,400
SSG-5 (Warehouse – east)	6681-1	11/20/2014	07:44	110	10 U	140	230	69

Notes:

BOLD value exceeds the lowest RSL for indoor air by a factor of 10 or more.

EPA U.S. Environmental Protection Agency
 FD Field duplicate
 HI Hazard index
 ID Identification
 µg/m³ Micrograms per cubic meter

NE Not established
 RSL Regional Screening Level
 SSG Sub-slab soil gas
 U The analyte was not detected at or above the reporting limit

3.0 SITE ACTIVITIES AND ANALYTICAL RESULTS

Section 3 summarizes field activities associated with post-mitigation VI sampling at the site. The mitigation systems had been in operation for about 4 weeks prior to sampling. EPA OSC Michael Davis and START Project Manager Jenna Mead met the landowner and a representative of the bar at the site the morning of March 8, 2016. Indoor air samples were collected at two locations within the bar to determine whether vapors were being adequately mitigated. A copy of the START field logbook is in Appendix B, and a photographic log is in Appendix C.

Summa canisters fitted with 8-hour flow regulators were placed at the dance floor area and at the back lounge area of the bar near sub-slab ports SSG-4 and SSG-3. START and EPA returned to the site that afternoon to collect samples. All Summa sampling accorded with EPA Environmental Response Team Standard Operating Procedure (SOP) 4231.1704 – Summa Canister Sampling.

Table 3 summarizes the indoor air samples (submitted under Analytical Services Request [ASR] 7024) collected at locations shown on Figure 3 in Appendix A. No ambient air sample was collected during this sampling event.

Copies of EPA's field sheets for these samples are in Appendix D. In addition to locations and sampling times, field sheets include notes on Summa canister numbers, regulator numbers, and pressures at the beginning and end of the sampling period. Analytical data for ASR 7024 are in Appendix E.

Table 3 lists post-mitigation results for the five VOCs of concern. November 2014 results from the indoor air sample collected at the dance floor area near SSG-4 are included for comparison. PCE was the only VOC detected post-mitigation, and the concentrations were about 9 to 10 times lower than pre-mitigation levels.

TABLE 3

**SELECTED VOC SUMMARY OF MARCH 2016 POST-MITIGATION INDOOR AIR SAMPLES
INDEPENDENT PETROCHEMICAL CORPORATION SITE
ST. LOUIS, MISSOURI**

Sample Location ID	Sample Number	Sample Date	Sample Start Time	1,1-Dichloroethane	Chloroform	Tetrachloroethene	Trichloroethene	Vinyl Chloride
				Concentration (µg/m³)				
EPA RSL (Industrial Air), 1E-05 cancer risk				77	5.3	470	30	28
EPA RSL (Industrial Air), HI=1 (non-carcinogenic effects)				NE	430	180	8.8	440
Indoor Air Samples								
Indoor @ SSG-4 (Bar – dance floor)	6681-5	11/20/2014	08:13	17	1.0 U	19	3.2	0.96
Indoor @ SSG-4 (Bar – dance floor)	6681-5-FD	11/20/2014	08:13	17	1.0 U	19	2.0	0.94
Indoor @ SSG-4 (Bar – dance floor)	7024-1	3/8/2016	08:05	0.82 U	0.99 U	1.4	1.1 U	0.52 U
Indoor @ SSG-3 (Bar – back lounge)	7024-2	3/8/2016	08:08	0.82 U	0.99 U	2.2	1.1 U	0.52 U

Notes:

EPA U.S. Environmental Protection Agency
 FD Field duplicate
 HI Hazard index
 ID Identification
 µg/m³ Micrograms per cubic meter

NE Not established
 RSL Regional Screening Level
 SSG Sub-slab soil gas
 U The analyte was not detected at or above the reporting limit

4.0 REFERENCES

- Ecology and Environment (E&E). 1989a. Preliminary Assessment of Independent Petrochemical Corporation Site, St. Louis, Missouri. April 21.
- E&E. 1989b. Trip Report for a Limited Site Inspection Report for the Independent Petrochemical Corporation Site, St. Louis, Missouri. January 24.
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- Miller, Don E. 1974. Water Resources of the St. Louis Area, Missouri. Missouri Geological Survey and Water Resources. Publication WR30.
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APPENDIX A

FIGURES



Legend

- | | |
|--|-----------------------------------|
| Ambient air sample location | Sub-slab soil gas sample location |
| DPT soil sample location | Sump water sample location |
| DPT soil and groundwater sample location | Approximate site boundary |
| Groundwater sample location | DPT Direct push technology |

* SSG-4 and SSG-5 were co-located with indoor air sample locations during the November 2014 sampling event.

Independent Petrochemical Corporation
3930 Chouteau Avenue
St. Louis City, Missouri

Figure 2
2014 Integrated Site Assessment
Sample Location Map

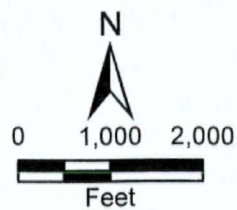
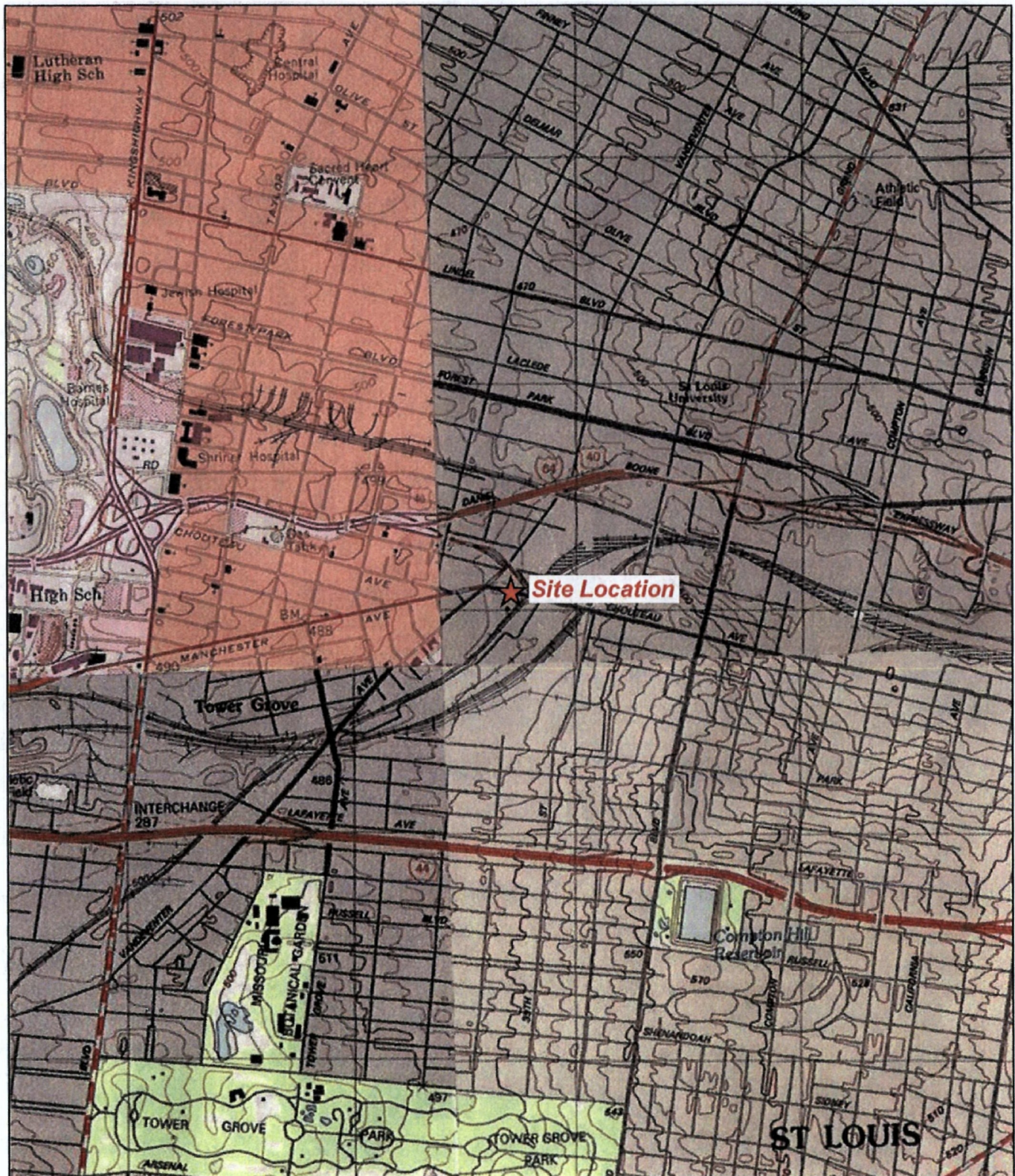


Source: ESRI, Online Data, World Imagery, 2013; The Sanborn Library L.L.C., 1998 Certified Sanborn Map, 1998

Date: 3/29/2016

Drawn By: Nick Wiederholt

Project No: X9025 14.0068.000



Source: USGS Cahokia, MO 7.5 Minute Topo Quad, 1998;
 USGS Clayton, MO 7.5 Minute Topo Quad, 1993;
 USGS Granite City, MO 7.5 Minute Topo Quad, 1998;
 USGS Webster Groves, MO 7.5 Minute Topo Quad, 1998

Independent Petrochemical Corporation
 3930 Chouteau Avenue
 St. Louis City, Missouri

Figure 1
 Site Location Map





Date: 2/10/2015

Drawn By: Nick Wiederholt

Project No: X9025.14.0066.000

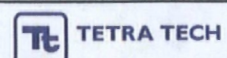


Legend

-  Indoor air sample location
-  Approximate site boundary

Independent Petrochemical Corporation
3930 Chouteau Avenue
St. Louis City, Missouri

Figure 3
2016 Indoor Air Sample Location Map



X:\0025\0066\000\Projects\mex\figure3_012916.mxd

Source: ESRI, Online Data, World Imagery, 2013; The Sanborn Library L.L.C., 1998 Certified Sanborn Map, 1998

Date: 3/29/2016

Drawn By: Nick Wiedenholt

Project No: X9025.14.0066.000

APPENDIX B
FIELD LOGBOOK

**Outdoor writing products®
for Outdoor writing people**



*All components of
this product are recyclable*

Rite in the Rain

A patented, environmentally responsible, all-weather writing paper that sheds water and enables you to write anywhere, in any weather.

Using a pencil or all-weather pen, *Rite in the Rain* ensures that your notes survive the rigors of the field, regardless of the conditions.

JL DARLING LLC
Tacoma, WA 98424-1017 USA
www.RiteintheRain.com

Item No. 311

NSN: 7530-01-433-5654
ISBN: 978-1-932149-29-6

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US Pat No. 6,863,940



KS 1425



Rite in the Rain®

ALL-WEATHER
LEVEL

Nº 311

X9025.14.0066.000
Independent Petrochemical
Corporation Site

2
2/1/14 PARTLY CLOUDY 80° LIGHT WIND
1155 ARRIVE AT SITE PATRICK
UMPHENOUR CRA ON SITE
1200 CONSTRUCTION SOLUTIONS
RICK NORLAND
1215 START GEOPHYSICAL SURVEY
STRUCTURE SCAN III
GPR + RADIO DETECTION (RD)
FIBER OPTIC LOCATOR - FIBER OPTIC
CABLE GOES FROM BAD DOG BAR +
CROSSES CHOUTEAU
1430 C CANADARI, SEAGULL ON SITE
1500 SAFETY MEETING
1515 START SO-1 COLLECT 4 SAMPLES
EM - CONDUCTANCE - 3 frequencies
- INDUCTANCE IN + OUT OF PHASE
- 2 FREQ
OPTICAL SURVEYS LOCATED
3 BORINGS REFERENCED
WITH GOOGLE EARTH
1650 AT 28' BGS
1730 AT 36' BGS WITH GW SAMPLER GW-1
1' GW IN BIT
DECON RODS
1820 OFF SITE
Remainder night samples

3
8/9/14
0715 DEPART FOR SITE GET ICE
0800 ARRIVE AT SITE USC'S
M B DAVIS, J FRY, L SENA ON
SITE, PAT E, CRA ON SITE
SET UP ON GW-1
0845 COLLECT GW-1 WAS ABLE
TO FILL 4 40-ML VIALS + RAN
OUT OF WATER
0900 PULL RODS LEAVING SCREEN +
TUBING IN BIT
DECON RODS
0930 SET UP AT SO-2 BETWEEN DOCK
+ AST SANDS
0937 START SO-2 CONCRETE AT
1' BGS OFF SET
0941 START SO-2 REFUSAL @ 1' OFFSET
0943 REFUSAL AGAIN @ 1' BGS
0948 REFUSAL @ 1' BGS
MOVE TO NEXT LOCATION
0954 START SO-2 TD - 12' BGS
1110 COLLECT GW-2 - 12' + MS/MSD
1300 MOVE TO SO-3
1305 START SO-3
1310 COLLECT SO-3 - 0-3.5

Rite in the Rain.

4 8/19/14
INSTALL PVC SCREEN + RISER TO
15' BGS
* GW-2 WAS COLLECTED THROUGH
PVC SCREEN + RISER - 1" DIAMETER
1436 START SO-4
1530 AT 16' BGS

INSTALL PVC - BHT COLLAPSED
GO TO 16' BGS WITH 15PT SAMPLER
NO WATER
1615 ADVANCE SAMPLER AGAIN, POSSIBLY
SAMPLER DIDN'T DEPLOY 1ST TIME

8/19/14
1545 SOIL SAMPLES COLLECTED
SO-1-0-3

1600 SO-1-4-8
1610 SO-1-8-10.5
1630 SO-1-12-16
8/19/14
1000 SO-2-0-3 + MS/MSD
1025 SO-2-4-8
1035 SO-2-8-10.5
1310 SO-3-0-3.5
1315 SO-3-4-7
1320 SO-3-8-12
1440 SO-4-0-3

5 8/19/14
1500 SO-4-4-7.5
1325 SO-3-12-16
1515 SO-4-8-12
1530 ~~656~~ SO-4-12-16 + DUP
1646 GW SAMPLE SET AT 16'-20'
BGS AT GW-4
PULL RODS UP - CHECKING FOR H2O
AT 5'-9' BGS HIT WATER
1530 COLLECT GW-4-9 + DUP
COLLECT SUDG, FPH + T METALS
AT GW-1
1800 PREPARE TB
1820 OFF SITE
Tanner Moore

Rite in the Rain

6

8/20/14 OVERCAST, 92, CALM
 0730 DEPART FOR SITE GET ICE
 SAFETY MEETING, L MOORE, C CANACARI
 M DAVIS, L SENA, J FRY

0900 START SO-5

0910 COLLECT SO-5-0-4

0920 COLLECT SO-5-4-8

0940 COLLECT SO-5-8-12

0955 COLLECT SO-5-12-12 + DUP

1025 AT 32' BGS ADVANCED BORING
 FOR LITHOLOGIC INFO

NO H₂O PROOVING AREAS IN BH
 OFF SET DOWN GRADIENT TO ATTEMPT
 TO GET GW

1105 START GW-5 38.62787, -90.24645

1120 L SENA OFF SITE

1130 AT 56' BGS NO WATER

1155 PULL UP 4' CK FOR WATER

1240 LUNCH

1300 ^{NO WATER} PULL RODS UP EVERY 4' + CK FOR WATER

1420 NO WATER IN BH

BH'S SO-2, SO-4 + SO-5 BACKFILLED WITH
 BENTONITE

1430 MOVE TO SO-6 AT CORNER OF WAREHOUSE

1435 START SO-6

7

8/20/14

1450 COLLECT SO-6-0-1.5

1510 COLLECT SO-6-8-12

1525 COLLECT SO-6-12-16

1545 START SO-7 38.62775, -90.24682

1550 COLLECT SO-7-0-4

1600 COLLECT SO-7-4-8

1630 COLLECT SO-7-8-12

1645 COLLECT SO-7-12-16

1730 COLLECT GW-6-14 THROUGH PVC
 SCREEN + RISEKS PERISTALTIC
 PUMP + DEDICATED TUBING

1800 OFF SITE

Alumina

Rite in the Rain

8
8/20/14 PARTLY CLOUDY LIGHT WIND, 90
0750 ARRIVE AT SITE

SAFETY MEETING, L MOORE, C CANAGAR,
M DAVIS, J FRY

0850 START SO-8 CORNER OF BAR

REPAIRING GEOPROBE

0930 COLLECT BLANK SAMPLE

0930 RESUME DRILLING

0955 COLLECT SO-8-4-8 (0935 BUT LABELS ALREADY
KILLED OUT

1000 COLLECT SO-8-8-2Z11.5

1015 MIKE DAVIS IS COLLECTING WATER
FROM CONCRETE TANK

3' OF ^{WATER} GRAVEL + LEAVES

- NO SEDIMENT SAMPLE COLLECTED

1150 COLLECT GW-8-12

BACK FILL B4 WITH BENTONITE

1230 OFF SITE

Ramon Moore

11/19/14 Wed.

0066.000

1200 - STM R Clayton arrives @

Enterprise to rental car

1245 - ARR @ EPA cave to get some additional
supplies: The sammas were picked up @ the
lab yesterday & field sheets & tags.

1720 - RC checks into hotel in St. Louis.

Rachel Clayton

11/19/14

Rite in the Rain.

11/20/14 Thu.

0066.000

0700. RC arrives @ the site. 21° AC
 Conestoga-Rovers & Associates Rep. Patrick
 Umpkenour is present Warehouse
 Leaser not yet present to open warehouse.
 0703- OSC, A. Ruiz on site
 0730- Warehouse opened
 0744- Start Warehouse SS Air sample SN3028
 @ Loc 5 (6681-1)
 0745- Start Warehouse Indoor Air sample SN3234
 co-located @ Loc 5 (6681-2)
 0747- Start Outside Air sample SN4565
 South of Warehouse (6681-3)
 0812- Start SS Air sample indoor Loc #4 SN3241
 (6681-4)
 0813- Start Indoor Air sample SN3029 (6681-5)
 Co-located with Loc #4 in bar
 0813- Start Indoor Air sample SN3021 (6681-5 FD)
 Co-located w/ indoor air sample 6681-5.
 0825- All leaving site.
 0840- Back @ hotel. will work on Field
 sheets & tags.
 1446- RC back on site to collect concurred
 samples. OSC Ruiz on site 3F°
 1459- Patrick U. arrives on site

RC 11/20/14

11/20/14 cont

0066.000

- 1510- Warehouse unlabeled to allow entry to
 collect the samples.
 1533- End collection of sample #1 @ SS-5
 pres = ϕ "Hg"
 1535- End collection of sample #2 Indoor @ Loc 5
 1540- End collection of sample #3 Outside Air
 1604- End collection of sample #4 SS-4 indoor
 1605- End collection of sample #5 Indoor @ Loc #4
 1606- End collection of sample #5-FD Dup @ Loc #4 Indoor
 1615- All canisters have been labeled &
 packed into the crate. RC will return to
 KC.
 2045- Arr in KC.

RC
 11/20/14

Rite in the Rain

11/21/14

1647 RC delivers 6 saccharine canisters
to EPA lab in KC, Mo. BR-6681 complete

RR Ceylan

11/21/14

3-7-16

1312 Jenna Mead depart KC
office for Saint Louis to
do indoor air post-VI system
sampling tomorrow @ site.
1730 Check in @ hotel. will
drive by site later

Jenna Mead

Rite in the Rain

3-8-16

- 0725 Get Summas ready
 0750 Arrive @ bar / warehouse site.
 0753 EPA & Kitchen Manager
 arrive @ site. She opens
 bldg. Says they are closed
 today.
 0805 start can R-0495 @
 dance floor
 S64 location
 0808 start can 4563 in
 back bar area.
 Per discussion / decision w/ EPA
 Mike Davis, will use 2 Summas
 in bar since it has the VI
 mitigation system installed.
 Previously 2nd whopper had
 been in warehouse garage
 area but no VI there, so no
 point in post VI sampling there.
 H1 @ 14.5 3.5 or Magna? ~~the~~
 2 pipes bounding
 H2 steady @ 12.9
 H3 ~ 0.5 bounding.
~~0830~~ Depart for Fenton office
 0830

3-8-16

- 1450 Depart Fenton office for
 site
 1525 at site, awaiting person to
 open bar.
 1540 Mike Davis on site. Still no one
 from bar. He called owner who
 will be here in ~ 15 min.
 1600 owner here
 1604 collect 7024-1 @ dance
 floor
 1605 collect -2 @ back bar
 Get end pressure & sk
 paperwork
 1630 Depart for KC.
 2030 Arrive KC

Jenna Head

Rite in the Rain

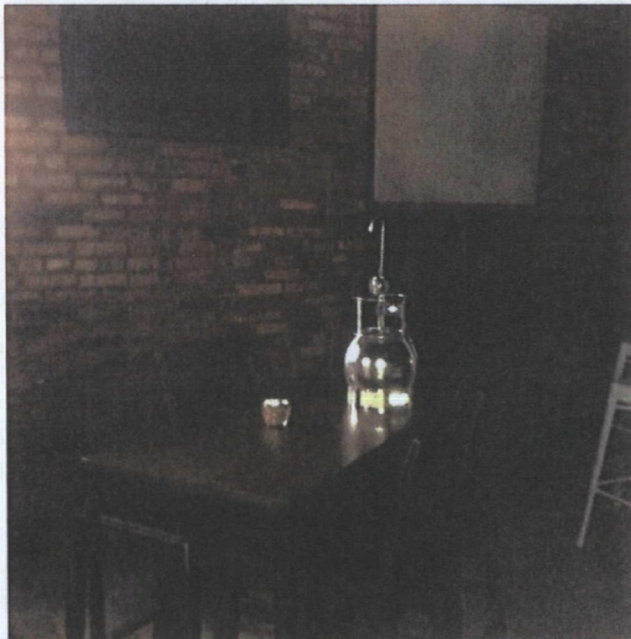
APPENDIX C

PHOTOGRAPHIC LOG

**Independent Petrochemical Corporation Site
Saint Louis, Missouri**

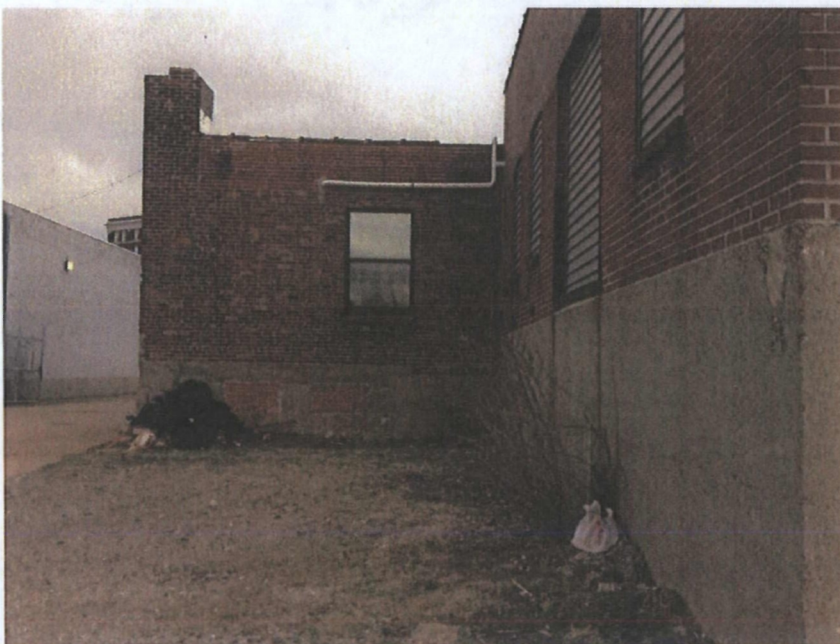


TETRA TECH PROJECT NO. X9025.14.0066.000 DIRECTION: --	DESCRIPTION	This photograph shows sample 7024-1 collection at bar dance floor near sub-slab gas port SSG-4.	1
	CLIENT	Environmental Protection Agency - Region 7	DATE 3/8/16
	PHOTOGRAPHER	Jenna Mead	



TETRA TECH PROJECT NO. X9025.14.0066.000 DIRECTION: --	DESCRIPTION	This photograph shows sample 7024-2 collection at back lounge area of the bar near sub-slab gas port SSG-3.	2
	CLIENT	Environmental Protection Agency - Region 7	3/8/16 3/8/16
	PHOTOGRAPHER	Jenna Mead	

**Independent Petrochemical Corporation Site
Saint Louis, Missouri**



TETRA TECH PROJECT NO. X9025.14.0066.000 DIRECTION: West	DESCRIPTION	This photograph shows southern edge of bar (west building) and piping for vapor mitigation system.	3
	CLIENT	Environmental Protection Agency - Region 7	DATE
	PHOTOGRAPHER	Jenna Mead	3/8/16



TETRA TECH PROJECT NO. X9025.14.0066.000 DIRECTION: East	DESCRIPTION	This photograph shows piping for vapor mitigation system at the west wall of the bar (west building).	4
	CLIENT	Environmental Protection Agency - Region 7	DATE
	PHOTOGRAPHER	Jenna Mead	3/8/16

APPENDIX D
FIELD SHEETS AND CHAIN OF CUSTODY FORM

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(Print) <u>Mike Davis</u>	NAME OF SURVEY OR ACTIVITY <u>Indep. Petrol Corp.</u>	DATE OF COLLECTION <u>8</u> <u>Mar</u> <u>2016</u> DAY MONTH YEAR	SHEET <u>1</u> of <u>1</u>
CONTENTS OF SHIPMENT			

CONTENTS OF SHIPMENT

SAMPLE NUMBER	TYPE OF CONTAINERS				SAMPLED MEDIA					RECEIVING LABORATORY REMARKS OTHER INFORMATION (condition of samples upon receipt other sample numbers, etc.)	
	<u>Summa</u> CUBITAINER	BOTTLE	BOTTLE	BOTTLE	VOA SET (2 VIALS EA)	water	soil	sediment	dust		other
	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
7024-1	1									X	
-2	1									X	
<div style="transform: rotate(-45deg); display: inline-block;"> ASK Complete Summa Method </div>											

DESCRIPTION OF SHIPMENT	MODE OF SHIPMENT
<u>2</u> PIECE(S) CONSISTING OF _____ BOX(ES) _____ ICE CHEST(S): OTHER <u>Summa canisters</u>	_____ COMMERCIAL CARRIER _____ _____ COURIER _____ <u>x</u> SAMPLER CONVEYED _____ (SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD

RELINQUISHED BY (SAMPLER) <i>Shaw Do</i>	DATE <i>3/9/16</i>	TIME <i>10:10</i>	RECEIVED BY <i>Bob Wiggins</i>	REASON FOR CHANGE OF CUSTODY <i>Rec'd at lab</i>
<input type="checkbox"/> SEALED <input checked="" type="checkbox"/> UNSEALED			<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED	
RELINQUISHED BY	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED			<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED	
RELINQUISHED BY	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED			<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED	

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 7024 Sample Number: 1 QC Code: Matrix: Air Tag ID: 7024-1-__

Project ID: MBDB788 Project Manager: Mike B. Davis
Project Desc: Independent Petrochemical Corp. sampling
City: St. Louis State: Missouri
Program: Superfund
Site Name: Independent Petrochemical Corp. - Site Evaluation/Disposition Site ID: B788 Site OU: 00

Location Desc: Basement Deneo Hoar @ Bar near SSG-4

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) Date Time(24 hr)

Latitude: _____

Sample Collection: Start: 3/8/16 08:05

Longitude: _____

End: 3/8/16 16:04

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 6 Liter Canister	None	60 Days	1 VOCs in Air at Ambient Levels by GC/MS

Sample Comments:

(N/A) SN R0495
Ref A0104425-9
start = 28
end = 3

Sample Collected By: TT

Sample Collection Field Sheet

US EPA Region 7

Kansas City, KS

ASR Number: 7024 Sample Number: 2 QC Code: ___ Matrix: Air Tag ID: 7024-2-___

Project ID: MBDB788 Project Manager: Mike B. Davis
Project Desc: Independent Petrochemical Corp. sampling
City: St. Louis State: Missouri
Program: Superfund
Site Name: Independent Petrochemical Corp. - Site Site ID: B788 Site OU: 00
Evaluation/Disposition

Location Desc: Back Bar Area Near SSG 3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) Date Time(24 hr)
Latitude: _____ Sample Collection: Start: 3/8/16 08:08
Longitude: _____ End: 3/8/16 16:05

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 6 Liter Canister	None	60 Days	1 VOCs in Air at Ambient Levels by GC/MS

Sample Comments:

(N/A) can 4563
Rq W 011 1504
Start=28
end pressure=0

Sample Collected By: TT

APPENDIX E

TRANSMITTAL OF SAMPLE ANALYSIS RESULTS FOR ASR 7024

**United States Environmental Protection Agency
Region 7
300 Minnesota Avenue
Kansas City, KS 66101**

Date: 03/25/2016

Subject: Transmittal of Sample Analysis Results for ASR #: 7024

Project ID: MBDB788

Project Description: Independent Petrochemical Corp. sampling

From: Margaret E.W. St. Germain, Chief
Laboratory Technology & Analysis Branch, Environmental Sciences & Technology Division

To: Mike B. Davis
SUPR/ERSB/PPSS

Enclosed are the analytical data for the above-referenced Analytical Services Request (ASR) and Project. The Regional Laboratory has reviewed and verified the results in accordance with procedures described in our Quality Manual (QM). In addition to all of the analytical results, this transmittal contains pertinent information that may have influenced the reported results and documents any deviations from the established requirements of the QM.

Please contact us within 14 days of receipt of this package if you determine there is a need for any changes. Please complete the enclosed Customer Satisfaction Survey and Data Disposition/Sample Release memo for this ASR as soon as possible. The process of disposing of the samples for this ASR will be initiated 30 days from the date of this transmittal unless an alternate release date is specified on the Data Disposition/Sample Release memo.

If you have any questions or concerns relating to this data package, contact our customer service line at 913-551-5295.

Enclosures

cc: Analytical Data File.

Project Manager: Mike B. Davis

Org: SUPR/ERSB/PP
SS

Phone: 913-551-7328

Project ID: MBDB788

Project Desc: Independent Petrochemical Corp. sampling

Location: St. Louis

State: Missouri

Program: Superfund

Site Name: Independent Petrochemical Corp. - Site
Evaluation/Disposition

Site ID: 8788 **Site OU:** 00

GPRA PRC: 303DC6

Purpose: Site Characterization

Vapor Intrusion sampling.

Explanation of Codes, Units and Qualifiers used on this report

Sample QC Codes: QC Codes identify the type of sample for quality control purpose.

Units: Specific units in which results are reported.

___ = Field Sample

ug/m3 = Micrograms per Cubic Meter

Data Qualifiers: Specific codes used in conjunction with data values to provide additional information on the quality of reported results, or used to explain the absence of a specific value.

(Blank)= Values have been reviewed and found acceptable for use.

U = The analyte was not detected at or above the reporting limit.

UJ = The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.

ASR Number: 7024

Sample Information Summary

03/25/2016

Project ID: MBDB788

Project Desc: Independent Petrochemical Corp. sampling

Sample No	QC Code	Matrix	Location Description	External Sample No	Start Date	Start Time	End Date	End Time	Receipt Date
1 - ____		Air	Dance floor at bar near SSG-4		03/08/2016	08:05	03/08/2016	16:04	03/09/2016
2 - ____		Air	Back bar area near SSG-3		03/08/2016	08:08	03/08/2016	16:05	03/09/2016

ASR Number: 7024

RLAB Approved Analysis Comments

03/25/2016

Project ID: MBDB788

Project Desc Independent Petrochemical Corp. sampling

Analysis	Comments About Results For This Analysis
----------	--

1 VOCs in Air at Ambient Levels by GC/MS

Lab: Region 7 ESAT Contract Lab (In-House)

Method: EPA Region 7 RLAB Method 3230.4G

Samples: 1-__ 2-__

Comments:

The lowest standard for 2-Hexanone and 4-Ethyltoluene was dropped in the initial calibration raising the reporting limits to 1.6 µg/m3 for 2-Hexanone and 2.2 µg/m3 for 4-Ethyltoluene.

The two lowest standards were dropped for 1,2,4-Trichlorobenzene in the initial calibration raising the reporting limit to 6.0 µg/m3.

Benzyl Chloride (39.47%) was biased high in the initial calibration and was UJ-coded in samples 7024-(1 - 2). The analyte was not found in the samples at or above the reporting limit however, the reporting limit is an estimate (UJ-coded) due to the initial instrument calibration not meeting specifications. The actual reporting limit for this analyte may be higher than the reported value.

ASR Number: 7024

RLAB Approved Sample Analysis Results

03/25/2016

Project ID: MBDB788

Project Desc: Independent Petrochemical Corp. sampling

Analysis/ Analyte	Units	1-__	2-__
1 VOCs in Air at Ambient Levels by GC/MS			
Acetone	ug/m3	11	13
Allyl Chloride	ug/m3	0.63 U	0.63 U
Benzene	ug/m3	0.65 U	0.65 U
Benzyl Chloride	ug/m3	1.0 UJ	1.0 UJ
Bromodichloromethane	ug/m3	1.4 U	1.4 U
Bromoform	ug/m3	2.1 U	2.1 U
Bromomethane	ug/m3	0.78 U	0.78 U
1,3-Butadiene	ug/m3	0.45 U	0.45 U
2-Butanone	ug/m3	1.7	3.1
Carbon Disulfide	ug/m3	0.63 U	0.63 U
Carbon Tetrachloride	ug/m3	1.3 U	1.3 U
Chlorobenzene	ug/m3	0.93 U	0.93 U
Chloroethane	ug/m3	0.53 U	0.53 U
Chloroform	ug/m3	0.99 U	0.99 U
Chloromethane	ug/m3	1.4	1.6
Cyclohexane	ug/m3	0.70 U	0.70 U
Dibromochloromethane	ug/m3	1.7 U	1.7 U
1,2-Dibromoethane	ug/m3	1.6 U	1.6 U
1,2-Dichlorobenzene	ug/m3	1.4	1.2 U
1,3-Dichlorobenzene	ug/m3	1.2 U	1.2 U
1,4-Dichlorobenzene	ug/m3	14	5.0
Dichlorodifluoromethane	ug/m3	2.9	2.8
1,1-Dichloroethane	ug/m3	0.82 U	0.82 U
1,2-Dichloroethane	ug/m3	0.82 U	0.82 U
1,1-Dichloroethene	ug/m3	0.80 U	0.80 U
cis-1,2-Dichloroethene	ug/m3	0.80 U	0.80 U
trans-1,2-Dichloroethene	ug/m3	0.80 U	0.80 U
1,2-Dichloropropane	ug/m3	0.93 U	0.93 U
cis-1,3-Dichloropropene	ug/m3	0.92 U	0.92 U
trans-1,3-Dichloropropene	ug/m3	0.92 U	0.92 U
1,2-Dichlorotetrafluoroethane	ug/m3	1.4 U	1.4 U
1,4-Dioxane	ug/m3	0.73 U	0.73 U
Ethyl Acetate	ug/m3	4.6	3.4
Ethyl Benzene	ug/m3	0.88 U	0.88 U
4-Ethyltoluene	ug/m3	2.5	2.2 U
Heptane	ug/m3	1.7	0.83 U
Hexachlorobutadiene	ug/m3	2.2 U	2.2 U
Hexane	ug/m3	0.71 U	0.71 U
2-Hexanone	ug/m3	1.6 U	1.6 U
Methyl tert-butyl ether	ug/m3	0.73 U	0.73 U
Methylene Chloride	ug/m3	0.70 U	0.70 U
4-Methyl-2-Pentanone	ug/m3	37	0.83 U
2-Propanol	ug/m3	4.4	3.9
Propene	ug/m3	0.39	0.69
Styrene	ug/m3	0.86 U	0.86 U

ASR Number: 7024

Project ID: MBDB788

RLAB Approved Sample Analysis Results

Project Desc: Independent Petrochemical Corp. sampling

03/25/2016

Analysis/ Analyte	Units	1-__	2-__
1,1,2,2-Tetrachloroethane	ug/m3	1.4 U	1.4 U
Tetrachloroethene	ug/m3	1.4	2.2
Tetrahydrofuran	ug/m3	0.60 U	4.8
Toluene	ug/m3	4.0	1.1
1,2,4-Trichlorobenzene	ug/m3	6.0 U	6.0 U
1,1,1-Trichloroethane	ug/m3	1.1 U	1.1 U
1,1,2-Trichloroethane	ug/m3	1.1 U	1.1 U
Trichloroethene	ug/m3	1.1 U	1.1 U
Trichlorofluoromethane	ug/m3	1.7	1.6
1,1,2-Trichlorotrifluoroethane	ug/m3	1.5 U	1.5 U
1,2,4-Trimethylbenzene	ug/m3	11	1.1
1,3,5-Trimethylbenzene	ug/m3	3.1	0.99 U
2,2,4-Trimethylpentane	ug/m3	0.94 U	0.94 U
Vinyl Acetate	ug/m3	0.73	1.2
Vinyl Bromide	ug/m3	0.88 U	0.88 U
Vinyl Chloride	ug/m3	0.52 U	0.52 U
m and/or p-Xylene	ug/m3	2.2	1.8 U
o-Xylene	ug/m3	1.4	0.88 U